BigBite Timing Hodoscope: Manual for JLab Hall A Shifter Workers

A condensed set of instructions for operation and maintenance of the BigBite Timing Hodoscope detector. For questions, please contact an expert, either Ralph Marinaro r.marinaro.1@research.gla.ac.uk, Rachel Montgomery at rachel.montgomgery@glasgow.ac.uk, or send an email to David Hamilton david.j.hamilton@glasgow.ac.uk, or contact by sending an email to Gary Penman g.penman.1@research.gla.ac.uk.

Created by Ralph Marinaro and Rachel Montgomery.

Fall of 2021 – first version.

Updates will be made in accordance with changes made to the detector and data acquisition system as the SBS experiment run groups progress.

USE THIS CHEAT SHEET FIRST!!!!

TIMING HODOSCOPE HV INSTRUCTIONS:

- **ssh into aslow@adaqsc**
    - **password available on paper sheet taped to wall in CH**
- **type go_hv, and EPICs gui will open**
- **navigate to BB Hodoscope Primary Channels tab and use "on/off" buttons to turn on or off the primary channels only**
    - **<u>do not</u> touch the tabs in the EPICs gui labeled "Hodoscope Left" or "Hodoscope Right"**
- **only use "on/off" buttons for primary channels,**
    - **<u>do not</u> touch the "Vset" or "Itrip" or any other column other than the buttons in the "on/off" column**

Contents

A.1 How to Troubleshoot the Detector:

If one or a few channels appear to go missing, or become noisy, and the proposed solution requires a controlled access, then simply make a log entry on halog, and we will wait until the next planned access from the RC. If a whole NINO card worth of channels go missing, or are noisy, or the whole side of one side of the detector, or the whole detector itself, then first check the LV, HV, DAQ, and if necessary, contact an expert, and leave it up to their discretion for how to proceed.

Problem	Cause	Solution
No Hits	Low Voltage OFF	Turn On the Low Voltage**
	High Voltage OFF	Turn On the High Voltage*
	DAQ Errors	Contact Expert (by phone)

Missing/Noisy Channel(s)	One Channel (Bad Connection)	Contact Expert (by email)
	16 Channels (Bad NINO)	Contact Expert (by email)
	All Channels (Bad Repeater)	Contact Expert (by phone)
High/Low Rate	High Voltages set too High/Low	Check settings of High Voltage
	NINO thresholds set too High/Low	Contact Expert (by email)

** Requires controlled access, no remote control through EPICs

* Check on EPICs first, then consider controlled access

To Troubleshoot EPICs:

OLD EPICS Instructions:

1. Make sure that there is a backup or documentation of the current HV settings.

2. Logon to aslow@adaqsc and type

```
telnet localhost 20000
exit
```

3. Verify that EPICS server restarts. A lot of stuff should be printed out. If there are what appear to be errors, contact Steve Wood.

4. Exit the EPICs session with Ctrl-] q and restart

5. Verify that the HV settings are correct and adjust if not.

NEW EPICS Instructions:

```
ssh aslow@adaqsc
ps -aux | grep java
kill -9 #####
```

Where ##### is all the old or current java sessions. Restart the EPICs gui.

If still a problem try to restart EPICs service through the HV mainframe by the following:

```
ssh aslow@adaqsc
xdg-open http://bbth-hv.jlab.org/
login: username - admin, password - admin
click – Setting Menu
click – Epics
click – Restart EPICS service

go back to Setting Menu

click – Reboot
click – Reboot System
Then, restart the EPICs gui.
```

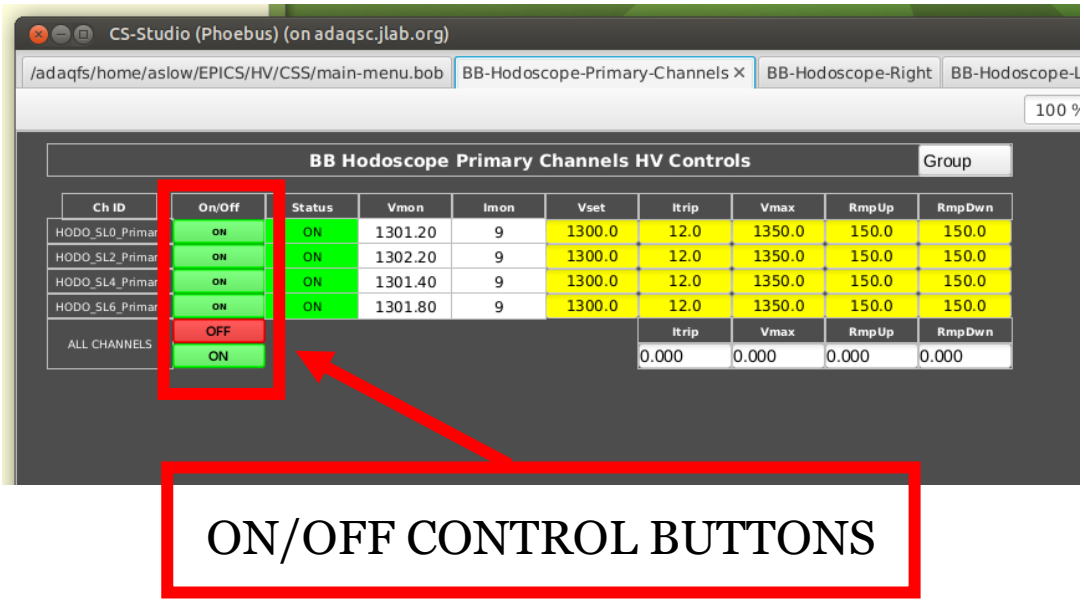
B.1 How to Check the High Voltage Values:

a. Using EPICs to check the high voltage values:

- From any Hall A computer in the command line type:
    - ssh aslow@adaqsc (get password from someone who knows it, or password paper taped to wall in CH)
    - go_hv

- The EPICS gui will open with no vnc server necessary, give it a few seconds. There will be drop down menus for all detectors, find the primary channels menu for hodoscope high voltage values.

- If the primary channels are off, then all other channels on the left and right will be off as well. If the primary channels are on, then all other channels on the left and right should be on as well. The primary channels should look as follows. To turn the whole detector on or off use the primary channels.



- If there is a disconnect in communication between EPICS and the hodoscope high voltage try the following:

- Sometimes killing the IOC on aslow@adaqsc will fix the hodoscope EPICS.

  Look for

  ```
  ../../bin/linux-x86_64/ioccaen ./st.cmd
  ```

  and kill it. It will restart.

B.2 How to Turn On the High Voltage:

***remote control is always the preferred first action**

a. Remotely Turning On High Voltage Main Frame:

- To use EPICs, as in section B.1, on any Hall A computer from the command line type:
    - ssh aslow@adaqsc
    - go_hv
- Use the EPICS gui to turn the high voltage on remotely, either press the ON bottom at the very bottom to turn on all channels in that tab or press the ON/OFF button on individual channels to turn on channels individually.

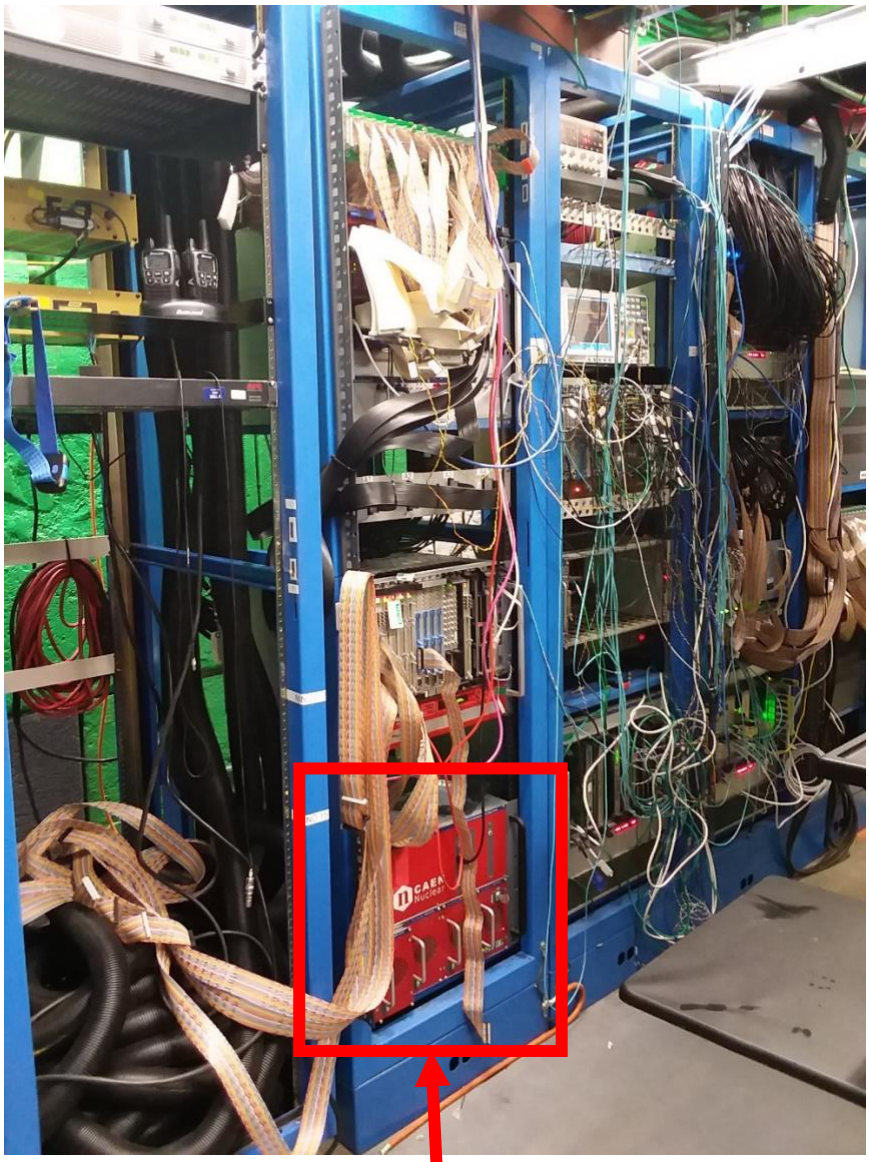
b. Manually Turning On High Voltage Main Frame:

***requires controlled access**

- Only power cycle HV manually as a last resort and with agreed controlled access permission from the RC.
- Locate the SBS detector electronics bunker in Hall A

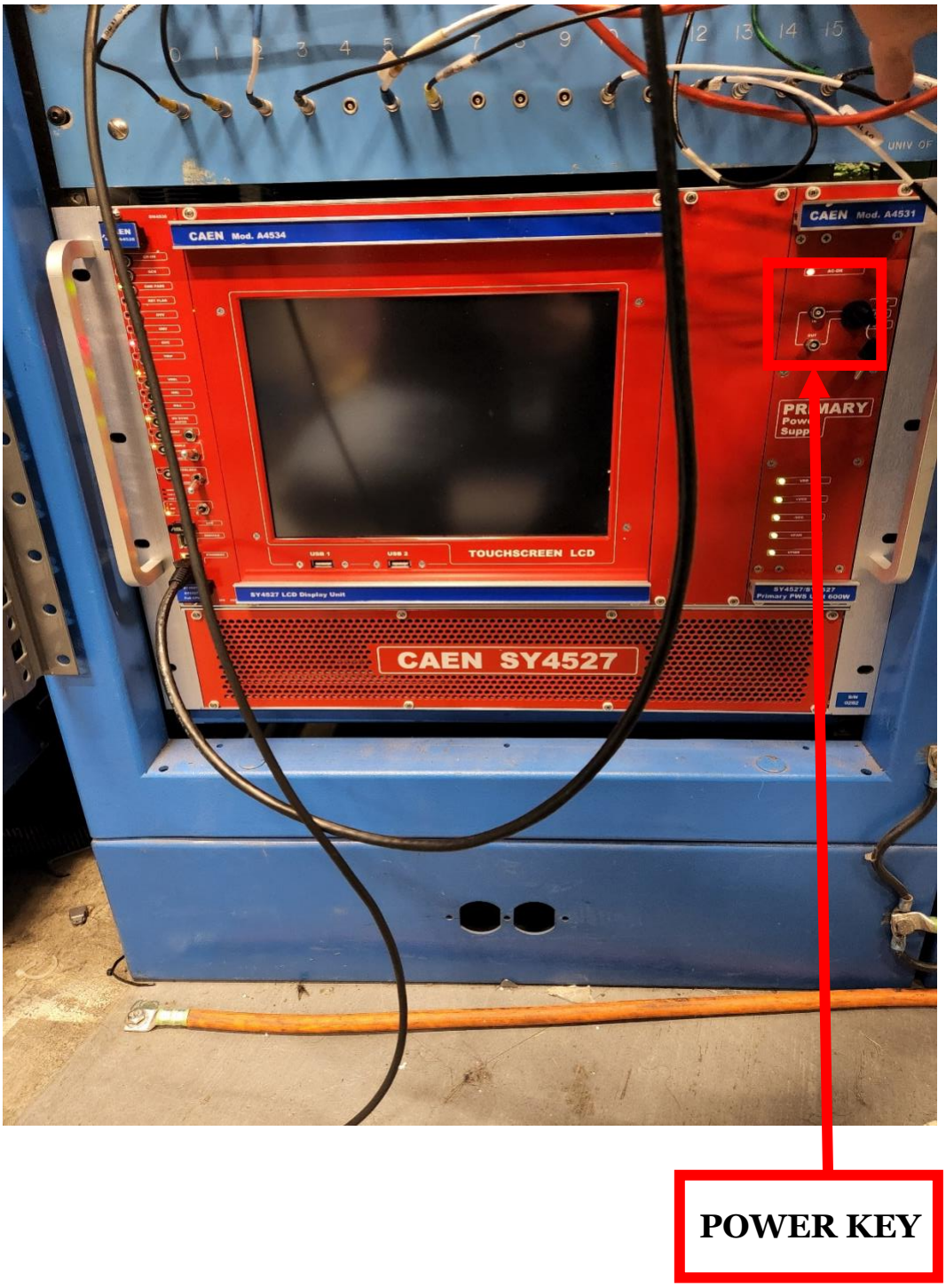
TIMING HODOSCOPE ELECTRONICS RACK

- Locate the electronics rack housing the high voltage main frame



HIGH VOLTAGE MAIN FRAME

- Turn the power key from “OFF” position to the right so the power key is in the “LOC” position



- If the high voltage main frame does not turn on, check the power switch on the back of the high voltage main frame. If that does not work, then please contact an expert for help.

B.3 How to Turn Off the High Voltage:

***remote control is always the preferred first action**

a. Remotely Turning Off High Voltage Main Frame:

- To use EPICs, as in sections B.1 and B.2, on any Hall A computer from the command line type:
    - ssh aslow@adaqsc
    - go_hv
- Use the EPICS gui to turn the high voltage off remotely, either press the OFF bottom at the very bottom to turn off all channels in that tab or press the ON/OFF button on individual channels to turn off channels individually.

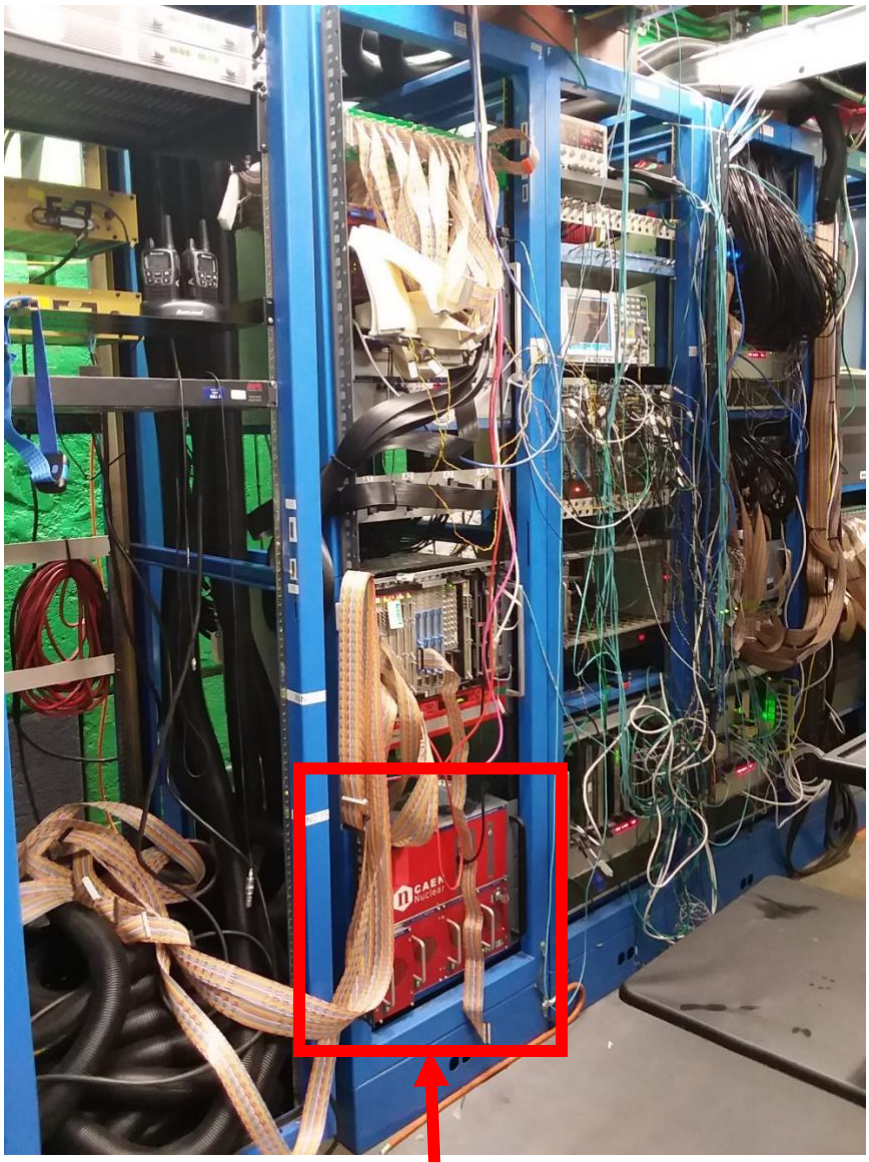
b. Manually Turning Off the High Voltage Main Frame:

***requires controlled access**

- Only power cycle HV manually as a last resort and with agreed controlled access permission from the RC.
- Locate the SBS detector electronics bunker in Hall A

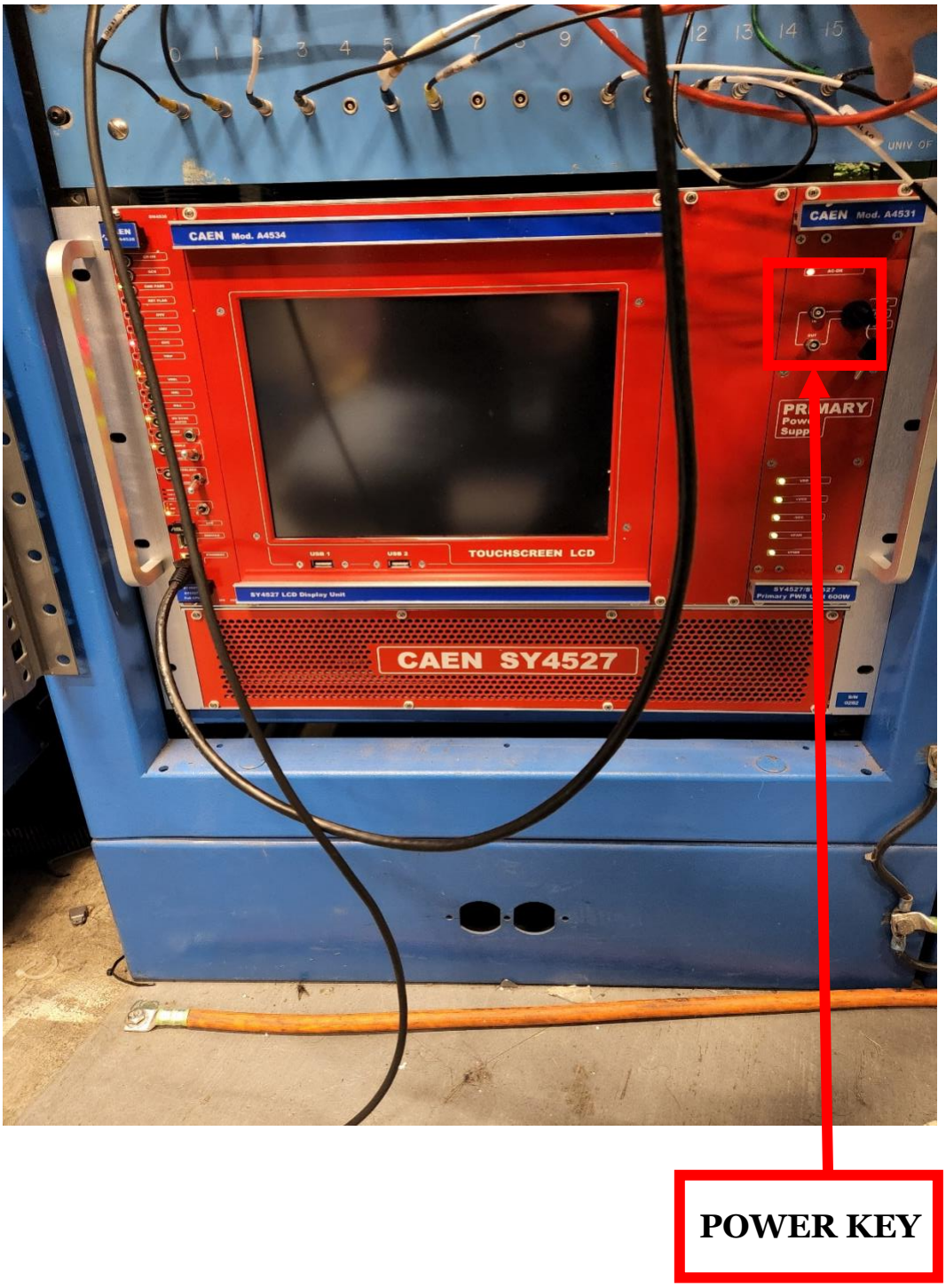
TIMING HODOSCOPE ELECTRONICS RACK

- Locate the electronics rack housing the high voltage main frame



HIGH VOLTAGE MAIN FRAME

- The power key should be in the “LOC” position, turn the power key to the left so the power key is in the “OFF” position.



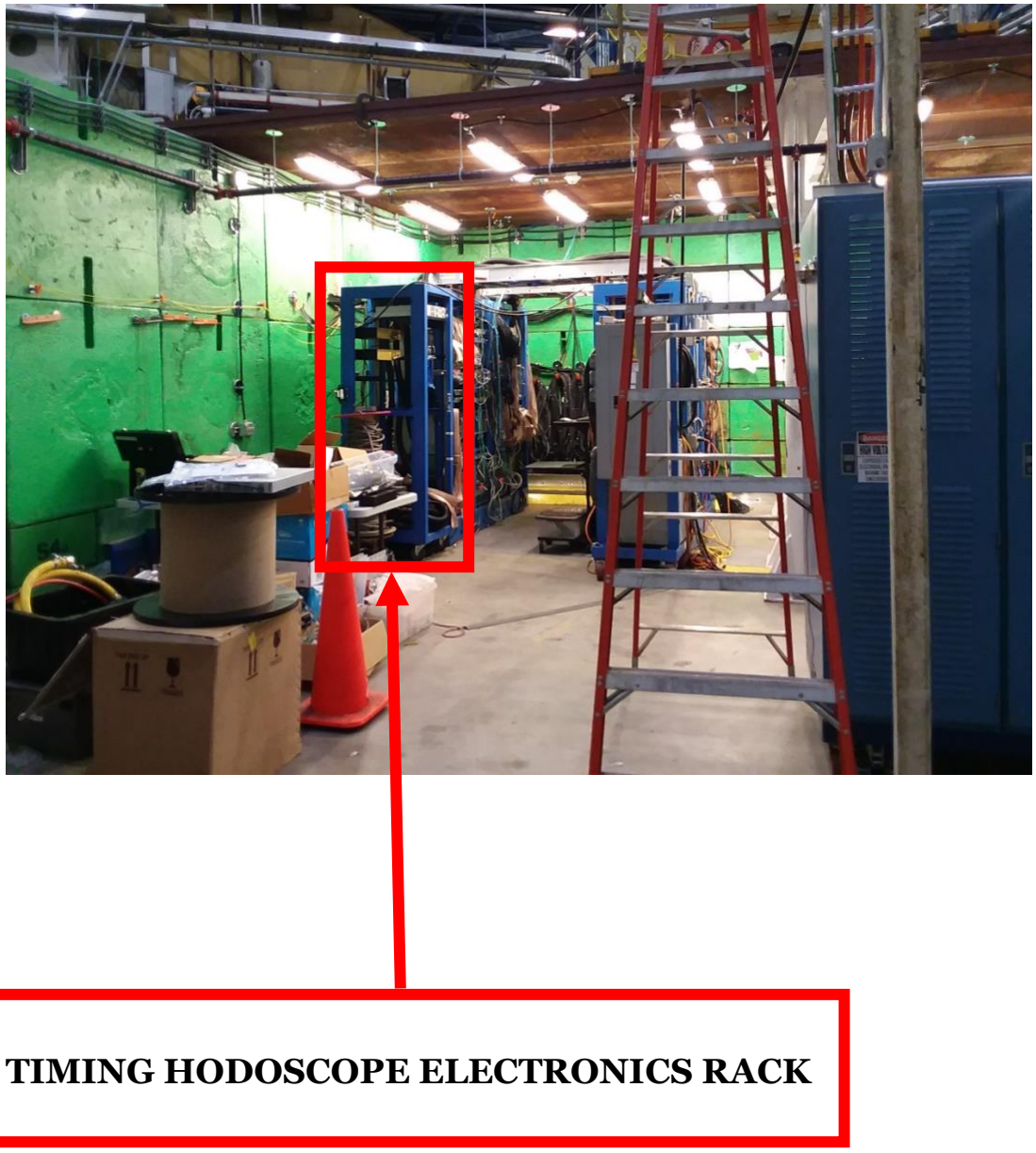
- If the high voltage main frame does not turn on, check the power switch on the back of the high voltage main frame. If that does not work, then please contact an expert for help.

B.4 How to Turn On the Low Voltage:

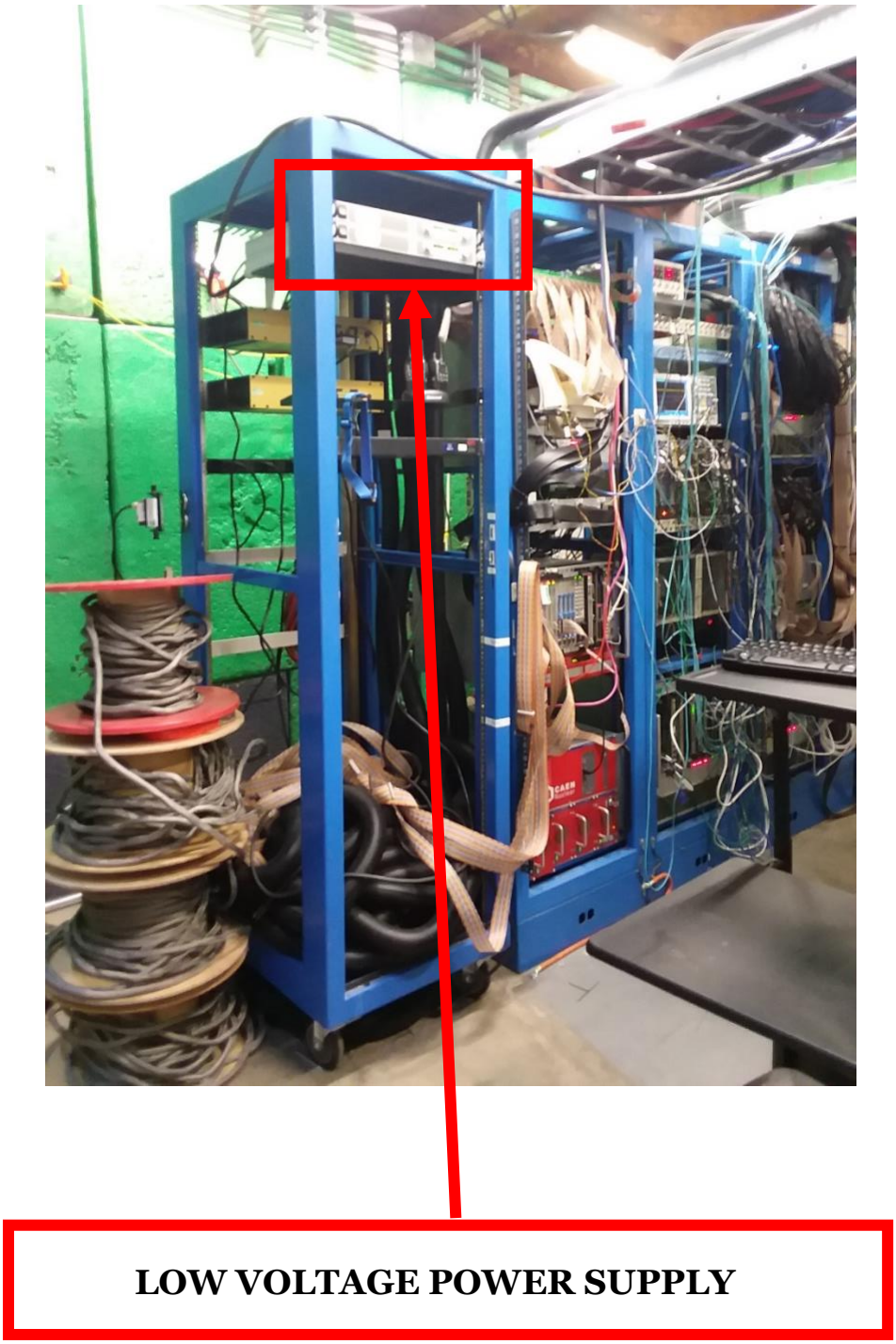
***requires controlled access**

a. Manually Turning On Low Voltage Power Supply:

- Locate the SBS detector electronics bunker in Hall A

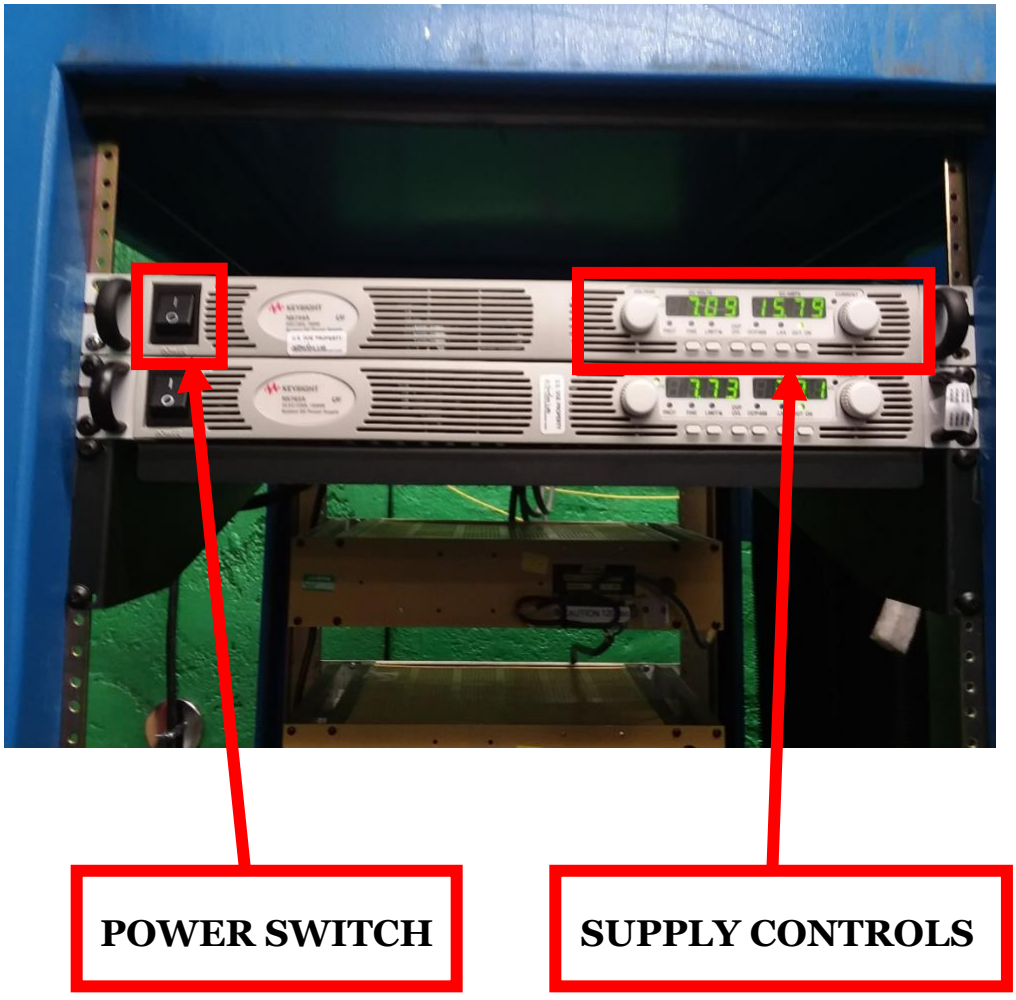


- Locate the electronics rack housing the low voltage power supply



- The power switch should be in the off position, flip the power switch to the on position. Adjust the voltage or current controls until the supply reads ~**7.1** volts and ~**15.79** amps.

- These values are set such that the NINO cards receive the minimum **5** volts necessary, and their thresholds are set to **1.6** volts.



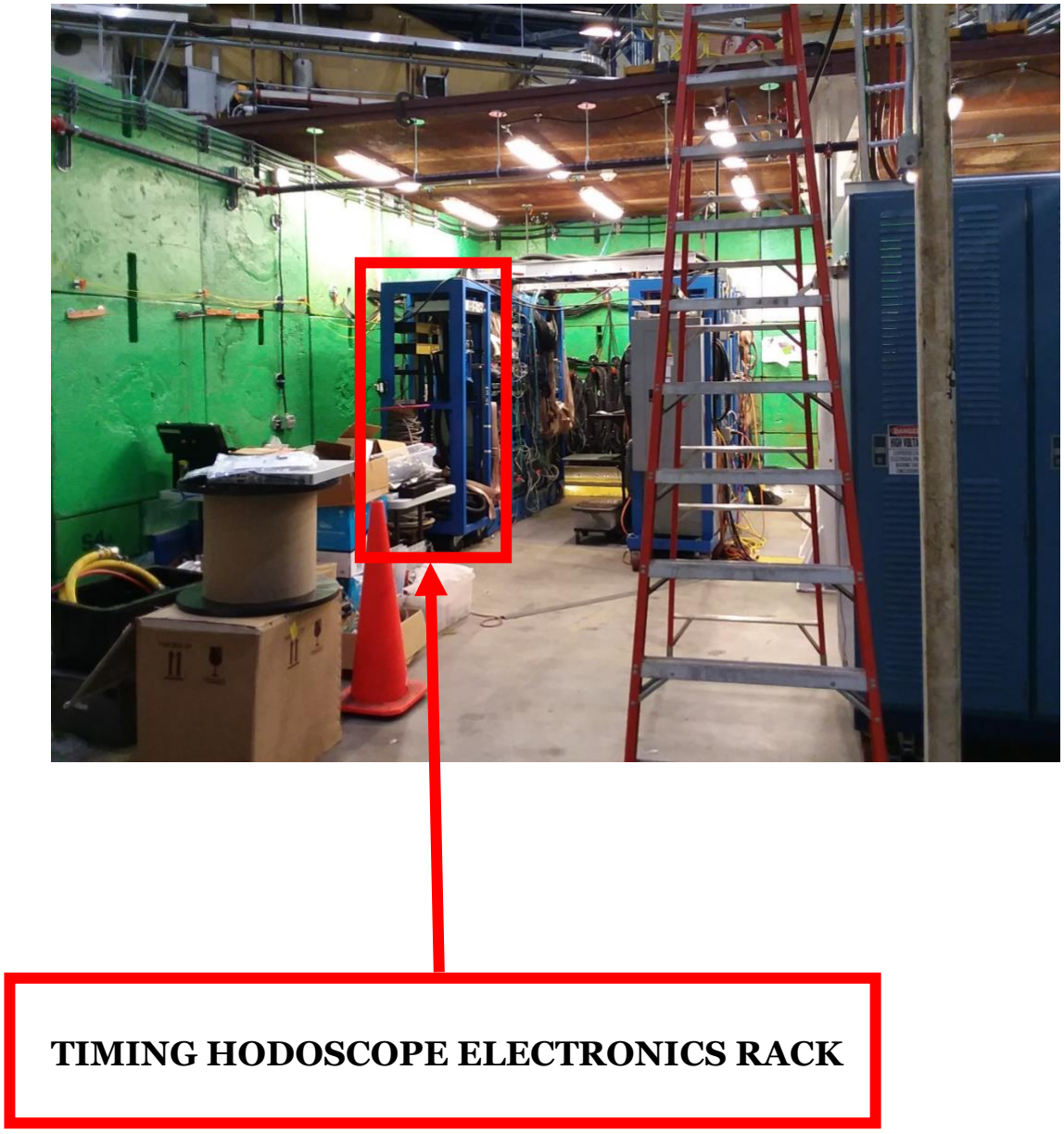
- If the low voltage power supply does not turn on, or if one of the supply controls do not work properly, then please contact an expert for help.

B.5 How to Turn Off the Low Voltage:

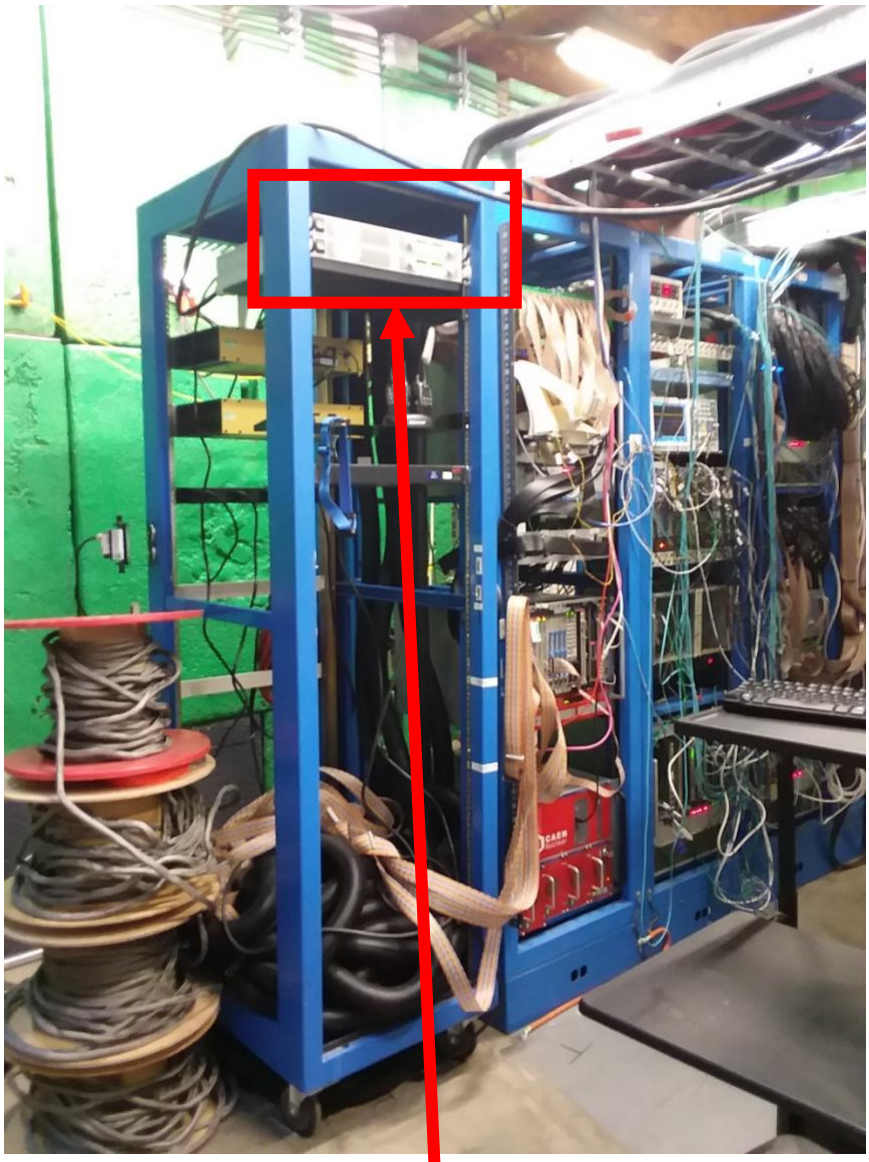
***requires controlled access**

a. Manually Turning Off Low Voltage Power Supply:

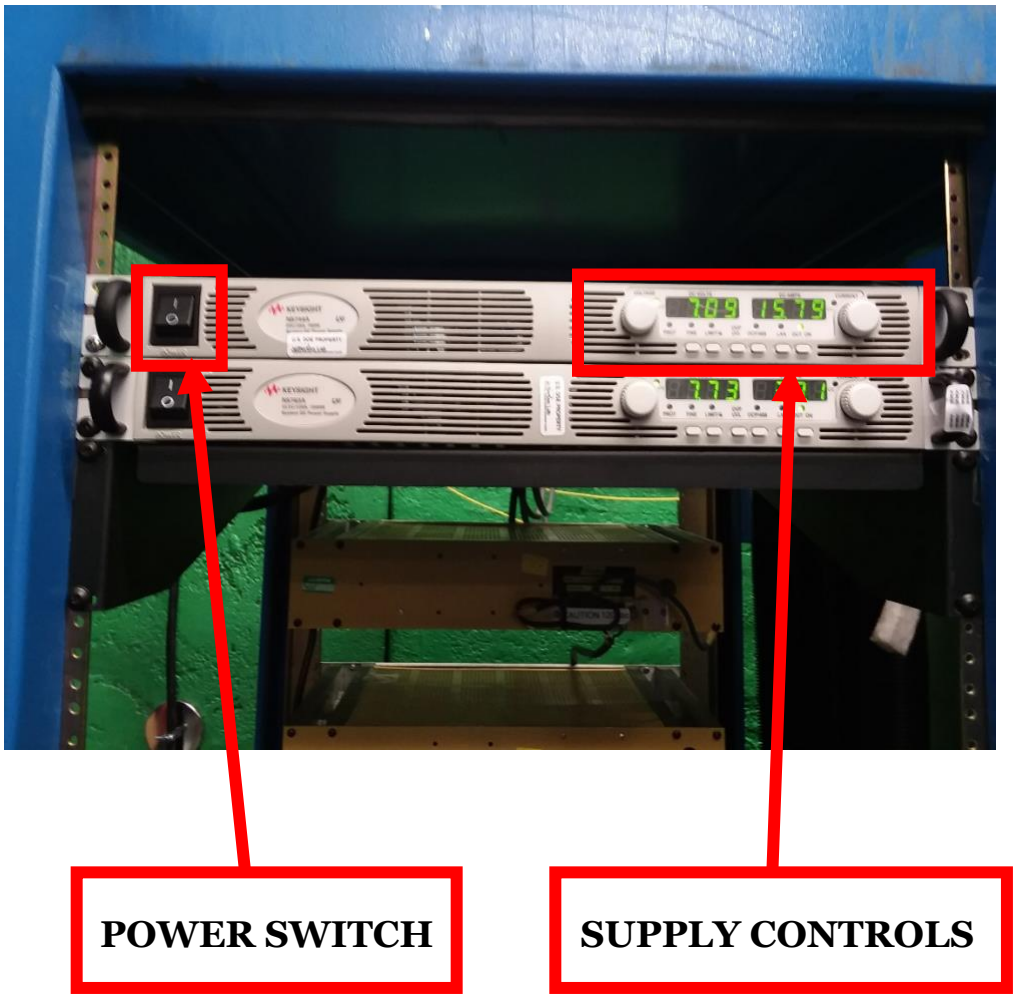
- Locate the SBS detector electronics bunker in Hall A



- Locate the electronics rack housing the low voltage power supply



- The power switch should be in the on position. Adjust the voltage or current controls until the supply reads ~**0.0** volts and ~**0.0** amps, then flip the power switch to the off position.



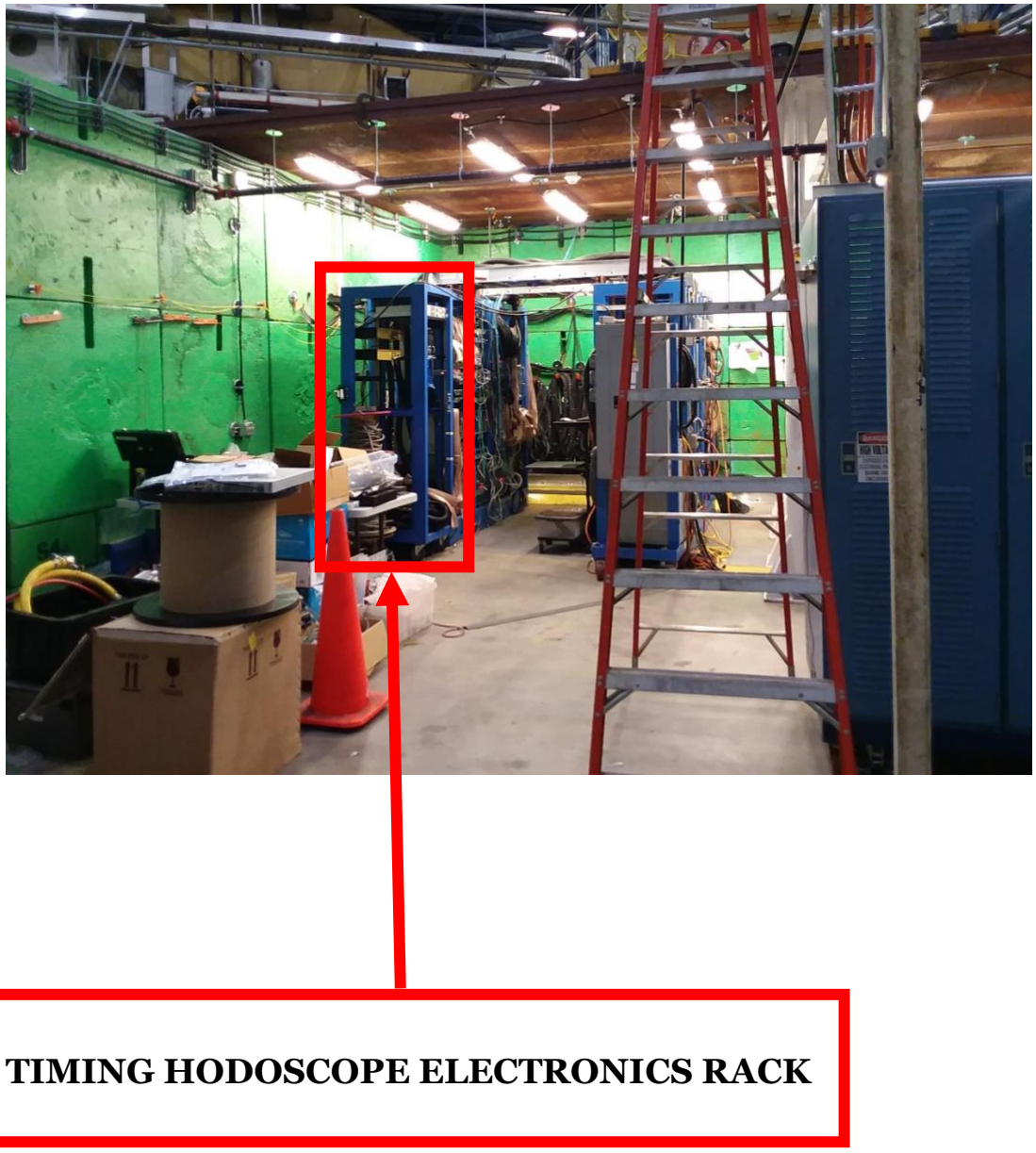
- If the low voltage power supply does not turn off, or if one of the supply controls do not work properly, then please contact an expert for help.

B.6 How to Power Cycle VME Crate:

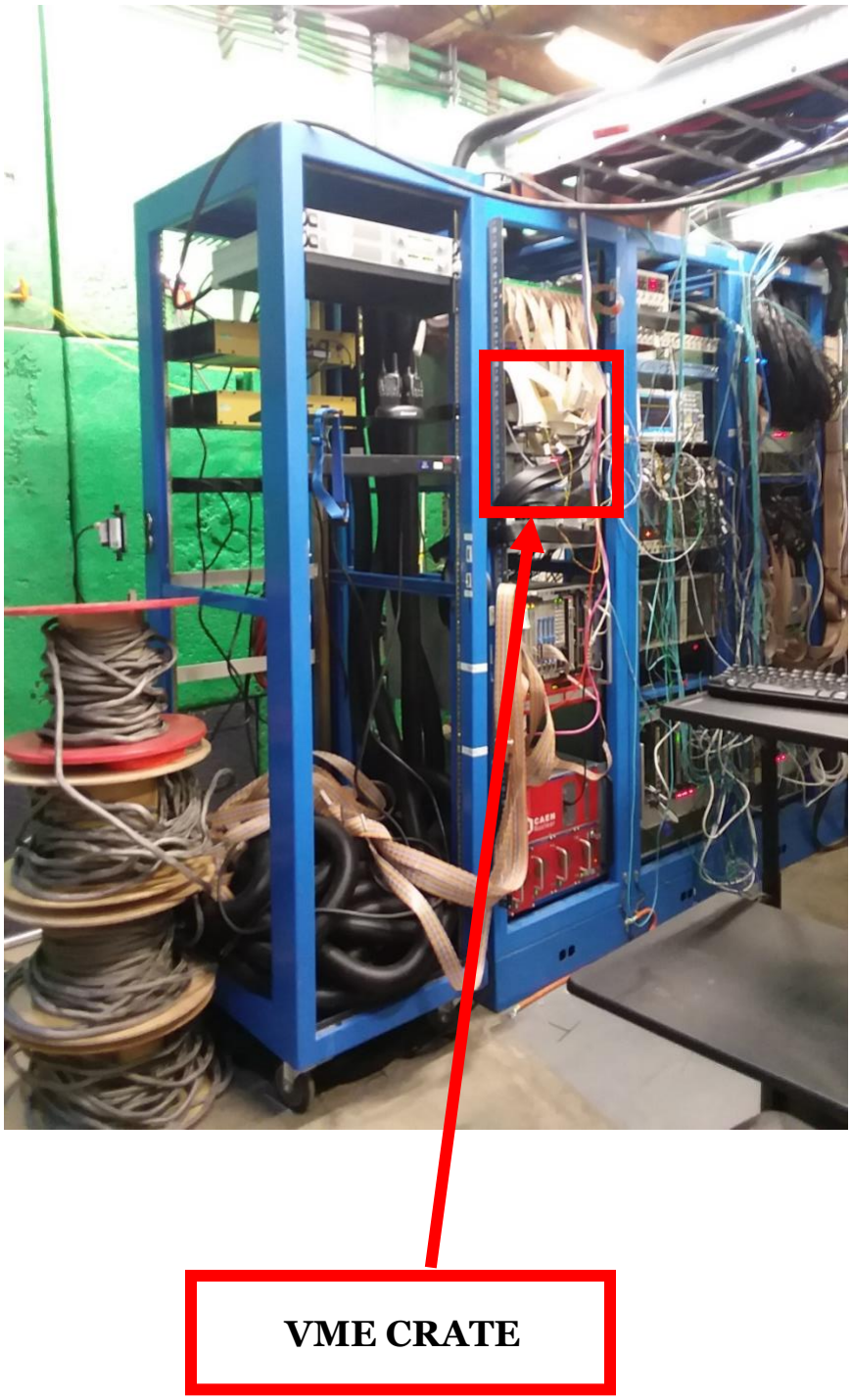
***requires controlled access**

a. Manually Power Cycling the VME Crate:

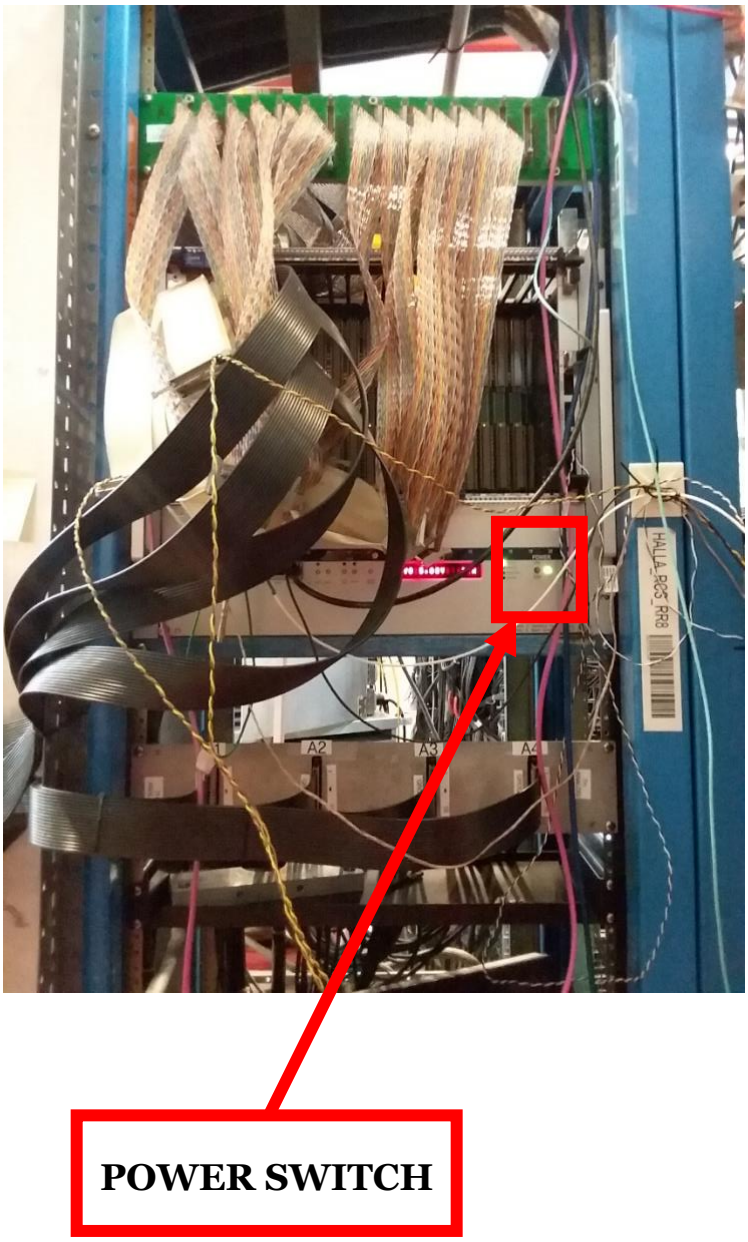
- Locate the SBS detector electronics bunker in Hall A



- Locate the electronics rack housing the VME crate.



- The power switch should be in the on position. Flip the power switch to the off position and then the on position to power cycle the VME crate.



- If the VME crate does not power cycle correctly, then please contact an expert for help.